



Setting an Example

Combating Climate Change in North America

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April 2008

Canada*West*
FOUNDATION

Other reports in the **Getting it Right Series** include:

Getting it Straight: A Guide to Economic Policy Instruments for Addressing Climate Change by Erin Mullinger.

Building On Our Strengths: An Inventory of Current Federal, Provincial, and Territorial Climate Change Policies by Jillian Bollinger and Dr. Kari Roberts.

Getting it Right: A Canadian Energy Strategy for a Carbon-Constrained Future by Dr. Roger Gibbins.

This report was prepared by Canada West Foundation Senior Policy Analyst Dr. Kari Roberts and is part of the Canada West Foundation's *Getting it Right Project*. Funding for the Getting it Right Project has been provided by the Max Bell Foundation and an anonymous philanthropic foundation. The opinions expressed in this document are those of the author and are not necessarily those of the Canada West Foundation's Board of Directors, advisors, sponsors, or funders. Permission to use or reproduce this document is granted for personal or classroom use without fee and without formal request provided that it is properly cited. Copies may not be made or distributed for profit or commercial advantage. A free electronic version of this document can be downloaded from the Canada West Foundation website (www.cwf.ca).

1. Introduction

This report outlines notable public policy efforts in select jurisdictions in Canada and the United States to address the challenge of climate change. Given the inseparability of climate change policy and energy policy, this report acknowledges innovations in pursuit of sustainable communities through public policy centering on energy conservation and emissions reduction. The report reveals that, from smaller cities like Winnipeg, Manitoba to the much larger State of California, jurisdictions across North America are working to find solutions to the shared problem of climate change.

Naturally, different jurisdictions have different levels of emissions and varying resources at their disposal to address them. This report examines jurisdictions that are known for their wide basket of approaches to addressing climate change as well as those that have implemented specific but innovative policy tools for achieving their greenhouse gas emissions reduction targets.

The Canadian jurisdictions examined in this report are:

- Winnipeg, Manitoba;
- Quebec; and
- Charlottetown, Prince Edward Island.

The American jurisdictions identified are:

- Boulder, Colorado;
- St. Paul, Minnesota;
- Seattle, Washington;
- Portland, Oregon; and
- California.

Some jurisdictions across Canada and the US (including some that are discussed in this report) are involved in regional organizations that support collective efforts to reduce GHG emissions and are looking into formal arrangements for advancing this goal (e.g., setting up trading regimes). Two examples of this are briefly outlined in this report:

- the Western Climate Initiative (WCI); and

- the New England Governors/Eastern Canadian Premiers (NEG/ECP) Group.

An inventory of current federal and provincial government energy policies aimed at addressing climate change can be found in the Canada West Foundation report *Building On Our Strengths: An Inventory of Current Federal, Provincial, and Territorial Climate Change Policies* and can be downloaded at no charge at www.cwf.ca.

2. Canadian Case Studies

Winnipeg, Manitoba

The City of Winnipeg is one of a number of cities that have signed on to Partners for Climate Protection under the auspices of the Federation of Canadian Municipalities. Membership commits the city to reducing its greenhouse gas (GHG) emissions in municipal operations. In support of this goal, the city has created a Climate Change Action Plan (CCAP) outlining a comprehensive GHG reduction plan, which involves creating a GHG inventory and designing a set of strategies for reducing emissions. Given that Winnipeg's GHG emissions are derived largely from gas and diesel powered vehicles, natural gas used for heating, powering water pumps and sewage treatment (as well as methane arising from sewage and wastewater treatment), and organic waste deposited in landfills, its emissions strategy targets these areas specifically.

Before identifying the city's CCAP strategies, it is worth mentioning that, in taking an inventory of the city's overall GHG emissions, there are a few important considerations. First, because Winnipeg relies heavily upon the use of hydro-electric power, its overall emissions are lower than a city of comparable size. Second, the Province's Power Smart program has lowered the city's use of electricity and natural gas, which has led to emissions reductions in advance of the implementation of the CCAP.

The CCAP promises a 20% reduction in GHG emissions from 1998 levels by 2018 and appears to be well on its way to reaching this goal; Winnipeg boasts a 15.5% reduction in GHG emissions between 1998 and 2003. Moving forward, the city aims to ensure

its GHG emissions levels do not rise, and in support of this goal, the following approaches have been identified in the CCAP:

- Promoting energy efficiency and renewable energy in city facilities;
- Implementing green building standards for new city facilities;
- Ensuring LEED certification for key city staff;
- Membership in the Manitoba chapter of the Canada Green Building Council in order to secure access to leading edge developments in building technology;
- Developing an energy efficient practices education/promotion program;
- Providing information on fuel efficiency and other environmental options to city fleet managers to enable them to make better purchasing decisions;
- Offering a fuel efficient driving techniques course for city drivers;
- Reducing the number of vehicles in the municipal fleet and replacing older vehicles with newer, more energy efficient vehicles;
- Issuing administrative directives to reduce city vehicle idling;
- Learning best practices from “green fleet” operations in other jurisdictions;
- Embarking upon a biofuels test project for the city’s vehicle fleet;
- Purchasing diesel-electric hybrid buses;
- Promoting water conservation for commercial, industrial and residential uses;
- Replacing existing traffic signals with high efficiency LEDs;
- Implementing a methane gas recapture project at the Brady Road Landfill;
- Requiring annual collection of GHG indicators (fuel, energy, etc.) among all departments and special operating agencies; and
- Creating public awareness about recycling, conservation and energy efficiency through the city’s intranet site.

The above programs all come with verification procedures, in order to ensure compliance with city regulations. Progress will be measured via annual GHG inventories, and city council will receive a five-year update in 2008, all intended to reveal potential modifications to the CCAP (if needed) to ensure targets are met.

More recently, and building upon the successful momentum of the CCAP, Winnipeg Mayor Sam Katz announced the development of a Green Vehicle Plan for Winnipeg that would “reduce idling in the city’s fleet, explore the use of biodiesel fuel, and mandate the purchase of hybrid fleet vehicles wherever possible”—all in the interests of fuel savings and GHG reductions.

More information about Winnipeg’s environmental strategy is available at: <http://winnipeg.ca/interhom/greenspace/>

Quebec, Canada

The province of Quebec was the first North American province or state to implement a carbon tax on hydrocarbons. Collection of the carbon tax began in October 2007 and funds are earmarked toward a Green Fund to help the province fight global warming and meet its Kyoto targets. Fifty energy companies are required to pay the tax including producers, refiners and distributors. Companies pay 0.8 cents/litre on gasoline they distribute in Quebec; they must pay 0.94 cents/litre on diesel. The anticipated revenues from this tax are about \$69 million a year from gasoline sales, \$36 million from diesel fuel and \$43 million from heating oil.

Carbon taxes are often viewed as a way of ensuring that the costs of addressing greenhouse gas emissions can be shared across all sectors of the economy and society. But in Quebec, the government has indicated that it expects big oil and gas companies to pay, since they have been enjoying large profits in recent years. The province has said that it expects companies not to pass on the entire cost of the carbon tax to consumers, but critics note that, because the tax is paid at consumption, and not at the level of production, it is difficult to see how the cost will not be passed on to consumers.

This Just In: British Columbia

In its 2008 budget, the BC government announced a number of green initiatives, among them a carbon tax to take effect July 1, 2008. The tax aggressively goes after polluters by imposing a \$10 per tonne tax on carbon emissions, applied to gasoline, diesel and home heating fuel. The tax will rise \$5 per tonne per year for the first four years, resulting in a \$30 per tonne tax by 2012.

The tax will be revenue neutral, and enables the government to lower personal income and corporate taxes in the province. It is expected to generate \$1.8 billion over three years. BC's carbon tax is part of what is arguably the most ambitious package of climate change policies enacted at the provincial level, though its success remains to be seen, as the tax does not take effect until later this year.

There are critics to this approach however, who argue that, instead of being revenue neutral, the carbon tax should redirect revenue into a fund for research and development into new and emerging carbon combating technologies. Since the BC Climate Plan is relatively new, it remains to be seen the degree to which it will be effective. Supporters claim that it is a step in the right direction and that BC has demonstrated leadership among its peers in the fight against climate change.

Full details of BC's Green Budget 2008 are available at: <http://www.bcbudget.gov.bc.ca/2008/default.htm>

The hope was that the tax would be an incentive to producers to become more efficient and reduce their carbon emissions, but the fear is that the extra cost of doing business will simply be folded into the price that consumers pay for fuel. Industry has indicated an unwillingness to shoulder the burden alone.

Critics of the Quebec carbon tax say that the province already had some of the highest taxes on gasoline in the country, and that this tax was only adding to the burden. Also of note is the stipulation that the tax applies to gasoline sold in the province and this has implications for other regions in the country, namely Canadian oil producers outside of Quebec. This could also hurt the refining industry within Quebec, as they would be taxed both as producers and refiners and would be placed at a disadvantage when competing with firms in Ontario, for example.

Another criticism of the tax is that it raises prices on traditional energy (Quebec does not have coal, natural gas and oil industries to speak of), and privileges the producers of clean energy such as hydroelectric and wind producers, which are a key component of Quebec's economy. Given the newness of the tax, it may be too soon to get a full measure of its success.

Charlottetown, Prince Edward Island

Prince Edward Island is a promoter of bioenergy and district energy. Its capital, Charlottetown, with a population of just over

32,000, employs a biomass-fired district energy system to power many of its public buildings, which has both environmental and economic benefits.

District energy uses hot water or steam to generate power in one central location and then distributes energy through underground pipes to a web of buildings plugged into the central system. This energy can be used to heat space and water and can also be used to power cooling systems. District energy is renewable in that the used water can then be returned to the central system to be reheated for future use. As such, district energy renders individual building heating systems unnecessary.

District energy is not a new idea, though it was superseded by individual building heating systems following the birth of the petroleum industry after the Second World War. But, given the perceived scarcity of post-war oil in Europe, district energy remained in place there. It was, however, rendered obsolete in North America as both Canada and the US adopted individual building heating systems (complete with cooling towers, boilers and chillers). The advantage of district energy is that it is said to "increase energy efficiency, reduce air pollution, decrease emissions of ozone-depleting refrigerants, combat global warming, enhance fuel flexibility, facilitate the use of renewable energy, and help manage the demand for electricity." (<http://www.districtenergy.com/AboutUs/>)

District heating systems can be powered by a number of sources, from coal and natural gas to electricity and bioenergy. A number of jurisdictions throughout the world employ district heating systems that use bioenergy as their power source, though it is more common in Europe, as many countries adopted district heating in the 1970s in response to the oil crisis.

In Charlottetown, three small district heating plants were built in the 1980s: one to burn municipal waste to provide steam heat for the Queen Elizabeth Hospital, one to burn woodchips to heat provincial buildings and select buildings in the downtown area, and a third to heat the University of PEI. Trigen Energy Canada Inc. purchased all three systems in 1995 and incorporated them into one all-encompassing district system, which became operational in 1998. The system includes a high-efficiency biomass plant to burn sawmill waste and a backpressure turbine that generates electricity to operate the plant. Any surplus energy is exported to the grid.

The district energy system continues to provide steam to the hospital and “delivers hot water to a 15 km hot water heat distribution system that runs throughout the core area of the city, serves over 60 customers and heats 84 buildings, including all the provincial buildings, the university, the technical college, two shopping malls and many other apartment and commercial buildings in the centre of Charlottetown.” In order to power these facilities, hot water is piped through special insulated pipes that retain heat and deliver the hot water to each building’s heat transfer station. Sensors monitor flow and temperature and cumulative energy use is registered on a digital meter for billing purposes.

Visit http://www.canren.gc.ca/renew_ene/index.asp?Cald=47&Pgld=956 for more information on Charlottetown’s district heating system.

As stated above, district energy offers both economic and environmental benefits to the city of Charlottetown. First, the district system is relatively inexpensive. Individual users do not pay to access the system, but they do pay a demand fee and an energy consumption fee. The demand fee covers the cost of the district system and hookup (tied to the consumer price index) and the Energy Charge relates to the amount of energy used. This benefits consumers, because they are able to avoid

massive price swings based on shifting oil prices. According to Natural Resources Canada (NRCAN), other economic benefits to the system are:

- Less capital is tied up in individual building heating systems and heating oil inventories;
- Eliminates heating system maintenance and replacement costs for customers;
- Allows for greater local self-sufficiency as the Charlottetown District Energy System burns some 66,000 tonnes of PEI’s waste materials to displace 17 million litres of imported light heating oil;
- Supports the local economy (estimates are that for every dollar spent on biomass fuel, 70 cents remains in the local economy compared to 10 cents for every dollar spent on oil); and
- Increases the profitability of the company that supplies the sawmill waste.

The environmental benefits from the District Energy system are tremendous. Carbon dioxide emissions are reduced, air quality is improved, and municipal waste is reduced.

The modern district heating system in Charlottetown is one of the first of its kind in Canada, though other jurisdictions have implemented similar systems, such as the Revelstoke Community Energy Project in BC, the Drake Landing solar powered district heating system in Okotoks, Alberta, and the Purdy’s Wharf seawater cooling system in Nova Scotia. All promote energy efficiency and contribute to reducing GHG emissions.

3. US Case Studies

Boulder, Colorado

The City of Boulder Colorado, a college town of about 100,000 people, was the first in the United States to implement a municipal carbon tax on emissions from electricity. Boulder generates most of its electricity from coal, though it does have a cogeneration plant (which produces heat and electricity through the wastewater treatment process), and half a dozen hydroelectric plants.

A carbon tax can be designed and implemented a number of ways, but the basic idea is to raise the cost of burning fossil fuels with the goal of both changing consumer (and producer) behaviour and generating revenue which can then be used to fund research and development of cleaner energy.

In 2002, the Boulder City Council passed a resolution adopting the goals of the Kyoto Protocol, thus promising to reduce its GHG emissions to 7% below 1990 levels by 2012 (which works out to about a 24% percent reduction from 2006 levels). In 2006, the City Council approved a Climate Action Plan to help address global warming. The Plan emphasized energy efficiency, renewable energy and the use of renewable fuels for automobiles, as well as the overall reduction of vehicle use and miles traveled.

Following public and private consultations, the City Council approved the Climate Action Plan (Initiative 102), which contained strategies for promoting renewable energy use and reduced vehicular use in Boulder, in addition to moving forward on its GHG reduction strategy. Part of its implementation strategy included asking Boulder voters to support a Climate Action Plan Tax (the carbon tax), which they did by a comfortable margin in November 2006.

Thus, Boulder was the first municipality in the US to implement a carbon tax on emissions from electricity, and it was supported by 58% of voters. The tax took effect in April 2007. Residents and businesses are charged a carbon tax, which is collected by the local utility company (Xcel Energy) and then funneled into the City's Office of Environmental Affairs. The tax is based on kilowatt hours consumed. Revenues from the tax will be allocated to the City's Climate Action Plan and should total approximately \$6.7 million by 2012, the date by which the City aims to have reduced its carbon emissions by 350,000 tonnes. Homeowners who use renewable energy receive an offsetting discount.

Since the tax has been in place for less than a year, it is difficult to get a full measure of its success. The funds generated from the carbon tax amount to approximately \$1 million per year to be spent on the City's climate change initiatives. This is not a large sum of money; it was forecasted to work out to approximately

\$1.33 per month for residential properties and \$3.80 per month for businesses. But perhaps where it will have the most effect is in the creation of awareness surrounding energy usage and conservation.

Critics have argued that the tax on energy consumption unfairly penalizes those members of society who can least afford it, as the low income rental units are often the least energy efficient, and residents are less able to afford the rise in rates. In response to this criticism, the City promised to direct many of the funds collected from the carbon tax toward helping to make multi-family units and low income rentals become more energy efficient.

The tax will, with hope, draw attention to personal consumption and generate a sense of personal responsibility for a global problem. While critics argue the tax is not significant enough to change behaviour, it is a step in the right direction that should help Boulder reach its Kyoto goals. With respect to enabling Boulder to pursue its climate change plan, it is meeting this need. But, like the Quebec carbon tax, it may be too soon to tell whether or not the carbon tax will be successful in reaching its goals.

Did you know?

While Quebec's carbon tax was the first of its kind in Canada, the idea is not new. Tony Blair's government in the United Kingdom implemented a climate change levy (CCL) back in 2001. It is a revenue neutral tax though, as the money is returned through subsidies for energy efficiency. Firms can avoid paying the levy by using renewable energy and the biggest energy users can avoid paying it entirely if they enter into voluntary agreements with the government to reduce their energy use. By some accounts, the CCL is working, as energy efficiency has increased in the UK by an average of 2% per year and emissions have gone down. But, it is not the same as a carbon tax, because it targets energy use, rather than carbon dioxide emissions.

St. Paul, Minnesota

Often referred to as the Twin Cities, Minneapolis and St. Paul have become fairly well known for their efforts at reducing energy use and increasing energy efficiency with economic, environmental and social benefits in mind. Since the early 1990s, the two cities have partnered in a host of initiatives designed to save money and to do their part to address the causes of global warming, namely the reduction of GHG emissions.

For their part both cities have been recognized nationally, and by the US Environmental Protection Agency (EPA) for their efforts at reducing waste, increasing energy efficiency and reducing emissions. In 2005 Minneapolis was listed among National Geographic's top 10 greenest US cities, and St. Paul made the list in 2006 (data for 2007 were not available at the time of writing).

St. Paul's efforts to promote sustainability have been quite comprehensive. Like Charlottetown, St. Paul boasts the largest hot water district heating system in North America as well as a large chilled water cooling system). The goal is for St. Paul to be "a leader and an innovator in the field of environmental preservation and sustainable development" (<http://www.stpaul.gov/initiatives/sustainable/SUSTAINABLE%20SAINT%20PAUL.pdf>). St. Paul's emphasis on GHG emissions and energy conservation are discussed below.

Clinton for Carbon Tax?

Although it receives scant attention today, US President Bill Clinton actually proposed something resembling a carbon tax back in 1995. It was called an energy tax and was designed with the goal of reducing greenhouse gases and the fight against global climate change in mind. But, as Salvatore Lazzari with US Congressional Research Service notes, the attempt to enact a broadly based energy tax based on BTUs (British thermal units) was rejected by Congress and instead became an across-the-board increase in motor fuels taxes by 4.3¢/gallon (See <http://kuhl.house.gov/UploadedFiles/energy%20tax.pdf> for more information.)

St. Paul encourages active transportation, and improvements in local transit in an effort to motivate citizens to reduce their vehicle use. The City, in partnership with Minneapolis, is planning a Central Corridor Light Rail Transit system to connect the downtown cores of the two cities. This is consistent with the St. Paul transit-oriented development (TOD) plan's focus on higher density development within easy walking distance of major transit stops.

Also to encourage public transit use, city employees are offered free annual transit passes (Metropass) and, for other commuters, the annual pass is subsidized by employers in the downtown area who in turn receive a tax incentive (between 50-90% of the fare is subsidized).

In addition to public transit, St. Paul is the first jurisdiction in the United States to have implemented a car-sharing program consisting entirely of fuel-efficient, gas-electric hybrid vehicles. One vehicle in a car-sharing program is thought to replace 20 personal vehicles and thus goes some distance toward reducing vehicle emissions.

In 1992, St. Paul and Minneapolis joined the International Council for Local Environmental Initiatives (ICLEI), which consists of 14 cities worldwide, all committed to the Urban CO₂ project aimed at reducing GHG emissions. St. Paul is an enthusiastic supporter of this project, which requires reduced energy consumption at 200 city work sites by installing energy efficient equipment funded by loans from the public utility Xcel energy, and the encouragement of "recycling and waste reduction, equipment/lighting conversions, water treatment efficiency, sustainable storm water and wetlands management, forward-looking land use planning and neighborhood development, energy-efficient heating/cooling, and environmentally-friendly transportation options."

In 2000, the ICLEI awarded the city with a Local Initiatives Award for its efforts to reduce GHGs (960,000 tonnes per year) at a total cost savings of \$59 million. As part of its efforts toward pollution control, the city also introduced a "green fleet" of school buses, a no-idling policy for public works vehicles, and the use of biodiesel in city vehicles.

The city built a new Solids Management Building, which recovers heat for use in steam power generation, and its turbine generation process produces an average of three megawatts of electricity, which is enough to meet 20% of its power demands and also to power about 1,000 homes. According to the city, this process uses about 80 percent less natural gas than the old system, which, based on natural gas price estimates from 2005, results in a savings of \$3 million a year.¹

Minnesota's Xcel Energy is one of the nation's leading suppliers of wind energy, which services Minnesota, Colorado and New Mexico (its Windsource program is one of the largest voluntary wind power programs in the US). Between its wind energy generation and its emissions reduction program, the state is well on its way to reaching its emissions reduction goal of 12 million tons by 2009.

St. Paul has also implemented Conservation Improvement Programs (CIP) that aim to increase ENERGY STAR purchasing, the conversion of street lighting and signal lamps, and supporting private sector energy conservation. This is all done with an eye to saving 81,497 tons of CO₂ gasses and \$7,934,000 annually.

Xcel energy is also undertaking a costly conversion project in which its coal-fired High Bridge power plant will be replaced with a natural gas fired combined-cycle unit, all to the tune of \$1 billion. This will reduce sulfur dioxide, nitrogen oxides and particulate matter by more than 90% and will increase electricity output from the plant by 270-280 megawatts (enough to supply almost 300,000 homes).

It is fair to say that part of the reason St. Paul is considered to be a leader among sustainable cities is due to its commitment to leading by example. Municipal departments and city operations conform to the principles of energy efficiency and conservation that underscore St. Paul's policy commitments, and this allows for the effective preservation and promotion of the city's green spaces. Its commitment to emissions reduction is exemplary and sets St. Paul apart from many US cities as a leader in addressing climate change.

Seattle, Washington

The city of Seattle has undertaken a host of measures aimed at addressing climate change. Among these are: the Department of Neighborhood's Climate Protection Fund, which provides funding for community driven projects to address carbon emissions; the Seattle Climate Partnership, which provides assistance to Seattle employers who wish to reduce the carbon footprint of their businesses (so far over 50 businesses have signed on); and the One Less Car Challenge and Uptown in Motion programs, both aimed at reducing driving trips and overall car trips (in the first two months, these programs have saved approximately 200 tones of carbon combined).

But perhaps the most targeted efforts to reduce GHG emissions are identified in the city's Climate Action Plan of September 2006 entitled, "Seattle, a Climate of Change: Meeting the Kyoto Challenge." The Plan sets an emissions reduction target of 7% below 1990 levels by 2012 and outlines an 18-point action plan to help reach this goal, the key components of which are outlined below.

The plan targets a decrease in vehicle use and therefore promotes investment in transit infrastructure in the neighbourhood of \$1.5 million, which will help to add 45,000 hours of transit service citywide. The plan also promises a further investment of \$3 million for transit corridor and reliability improvements, which would enable faster and more reliable service in the city's most congested areas, and money for synchronizing traffic signals to improve transit flow and reliability.

Taking its cues from the Washington State Department of Transportation, Seattle is directing funds (\$100,000 in the 2007-2008 budget) toward investigating the workability of regional road pricing in and around Seattle. This could include the creation of incentives to find alternatives to single occupancy vehicles such as road tolling.

With respect to reducing vehicle use, active transportation is encouraged. In the interest of making Seattle more pedestrian and cyclist friendly, the city has moved toward doubling the overall number of bike lanes by adding 20-30 miles of new bicycle lanes, as well as identifying four lane corridors that

can accommodate bicycle lanes. The Seattle department of Transportation is also financing the Urban Trails System, which connects various communities in and around the city through a system of off-road, signed, shared-use pathways.

In support of finding ways to encourage less vehicle use, Seattle adopted a commercial parking tax, announced in 2006, to be phased in over three years. The tax of 5% was added in 2005, which is slated to climb to 7.5% in July 2008, and 10% in July 2009.

The city's Office of Sustainability and Environment launched a comprehensive climate protection awareness campaign, including a "drive smart" component, which educates motorists and new car buyers on the issue of fuel efficiency. The city has also improved its Clean, Green Fleet program, which aims to reduce fossil fuel consumption through the purchase of more fuel efficient city vehicles; the city's fleet includes hybrid electric cars and the city is working with taxi companies and with the Police Department to increase the number of gas-electric vehicles on Seattle streets.

Additionally, the city launched an awareness campaign to promote biofuels as a climate change option and promised to increase the percentage of biofuels used in city vehicles and equipment (the city standard at the time of the 2006 release of the Action Plan was B20 [fuel containing 20% biodiesel] and this was raised to B40 in July 2007). The city is working actively to promote biofuels at the regional and state levels as well, including providing funding to "a public-private partnership that promotes policies and practices that increase the use of biofuels in transportation."

The city has also pledged to implement "smart fleets," to help reduce emissions from commercial fleets, as well as to work toward providing on-shore power to cruise and container ships, and to take measures to help improve the flow of freight traffic through the Port of Seattle. The more traffic through the Port, the greater the potential for increased diesel-emitting vehicles, thus measures such as decreasing congestion, reducing unnecessary ship idling and improving overall truck efficiency are a part of Seattle's overall strategy.

The city's public utility, Seattle City Light, has, and will continue to purchase, enough offsets as necessary to achieve zero net GHG emissions. The utility is contracted to buy 3% of its power needs with renewable wind energy, and promotes the federal tax incentives for home and business conservation measures in its promotional materials for customers.

Seattle boasts a "walk-the-talk" approach to addressing energy conservation and GHG emissions reduction. The city encourages its employees to take action at home and at work to reduce GHGs, including regulating that business-related air travel by city employees must be done through the purchase of carbon-offset projects annually. The city's public utility conducts an annual greenhouse gas inventory and has an action plan to address emissions in each of its areas of responsibility: water supply, drainage, wastewater and solid waste management.

The city has partnered with the private sector to create the Seattle Climate Partnership, a voluntary, non-governmental organization consisting of the City of Seattle and a host of local employers who work together to reduce their GHG emissions. Members help to achieve emissions reductions, while setting the right example for their employees by encouraging them to import conservation practices into their daily lives. Members help to achieve the community's GHG reduction goal and gain access to best practices information and technical support from a team of experts on climate solutions. Dozens of businesses joined the partnership including Starbucks Coffee and the University of Washington.

Seattle emphasizes the need for a coordinated approach to addressing climate change and thus promotes cooperation across all levels of government. In support of this, Seattle belongs to a host of regional forums with an interest in strong protection policy, and initiated the US Mayors Climate Protection Agreement in 2005. The group now claims over 800 mayors from cities across the United States; members promise to take action to reduce global warming in their communities, and they collectively support measures such as a cap-and-trade system for GHG emissions.

Seattle's Climate Plan is available at: <http://www.seattle.gov/climate>.

Portland, Oregon

Portland, Oregon, a city of just under 600,000 people (over 2 million people live in the Portland area), is often celebrated for its aggressive action on climate change, as well as its efforts to promote environmental sustainability through smarter community development. The city has been a municipal leader in the fight to lower GHG emissions.

Portland's 2001 Local Action Plan on Global Warming targets a 10% reduction of GHG emissions below 1990 levels by 2010 (this is more aggressive than the Kyoto Protocol). To achieve this ambitious target, the Action Plan has a number of key components, including implementing energy efficiency targets for buildings, meeting all growth in electricity demand through renewables, improving solid waste management and recycling, expanding carbon offsetting through re-forestation and better forest management, and encouraging innovation in research and development and public education.

In addition, the action plan specifically targets vehicle emissions reduction by attempting to decrease miles traveled to 10% below 1995 levels and improving fuel economy. In support of this, Portland has endeavoured to make the city more bicycle and pedestrian friendly and has invested in its transit system. Ultimately, all policy developments must, as a central objective, contribute in some way to reducing the impacts of global warming. Two key policy areas Portland has identified in its pursuit of reducing its GHG emissions are transportation and investment in renewable energy.

A 2001 report revealed that transit ridership had increased by 60% in Portland since 1990, and bicycle commuting was becoming more popular. But despite these encouraging numbers, total vehicle miles had also grown—by 34% in the Portland Metropolitan Area between 1990 and 1998. Thus, the city determined that more work was needed to alter transportation patterns in the city. Portland has therefore established a goal of decreasing vehicle use through incentives and disincentives, which include changes to auto insurance rates based on miles traveled, and raising parking rates in key commercial areas.

Transit-oriented development is integral to the goal of reducing miles traveled in the city. Changes to patterns of urban

development to make them more compact, better oriented toward active transportation, and to provide mixed use developments, have all been identified by the city as priorities. Naturally, these require further investment in infrastructure, partnered with public awareness campaigns to encourage people to see the value in driving less, or in car-pooling and driving more energy efficient vehicles. The city has also made efforts to lead by example through its purchase of hybrid and diesel vehicles, many of which are fueled by biodiesel.

The city has also committed to supporting the development of environmentally sustainable renewable energy projects to help meet its carbon emissions targets. Portland has partnered with PacifiCorp to develop wind farms and set a very ambitious goal of purchasing 100% of city government electricity from renewable resources by 2010.

Overall, Portland has taken a fairly aggressive approach to reducing carbon emissions. The city has managed to get its GHG emissions down to less than 1% above 1990 levels in 2006, per capita emissions have fallen 14%, there has been a 90% increase in transit use, and 150 LEED buildings have been completed or are underway. For its efforts, Portland was named the Green Power Partner of the year for 2003 by the EPA.

For information on Portland's sustainability plan see: www.portlandonline.com/osd/.

California, USA

According to National Geographic's Green Cities Guide, of the 10 greenest cities in the United States, three of them are in California—a state of about 38 million people. The state itself is widely viewed as an innovator when it comes to environmental policy and regulation. California has undertaken a number of initiatives designed to promote energy conservation and reduce the emission of carbon into the atmosphere; some of the more noteworthy examples are discussed below.

Renewable Portfolio Standard (RPS)

Back in 2002, Governor Gray Davis signed a bill requiring 20% of all California's electricity to come from renewable sources. Sellers were required to meet annual targets as they widened the base of available wind, geothermal, solar and biomass

energy sources. The program was later accelerated with a new target date of 2010, though it now appears this deadline will not be met. Nonetheless, an enhanced target of 33% renewable energy by 2020 is in sight, if the state commits to significant infrastructure investment.

Tailpipe Emissions Standard

California has taken advantage of the federal Clean Air Act, which allows individual states to set their own emissions standards. The state legislature enacted California's Clean Car Law, which would see a 30% cut in GHG emissions by 2016 for all cars sold in California, beginning with the 2009 model year. In so doing, California is targeting smog-causing pollutants such as hydrocarbons, nitrogen oxides, carbon monoxide, and particulate matter. The EPA has disputed California's right to implement its clean car program, but the state has taken the matter to the courts.

California Global Warming Solutions Act 2006

In 2006, California established a program of regulatory and market mechanisms to achieve GHG emission reductions. The act, also known as AB 32, requires the California Air Resources Board (CARB) to find ways to reduce GHG emissions by 25% by 2020. The CARB was tasked with keeping an inventory of emissions of California's major polluters. The act also gave the Governor special powers to suspend the emissions caps for one year, should it become economically necessary. Specifically, the Global Warming Solutions Act requires:

- Establishing a statewide greenhouse gas emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopting mandatory reporting rules for significant sources of greenhouse gases by January 1, 2009;
- Adopting a plan by January 1, 2009 indicating how emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions;
- Adopting regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas, including provisions for using both market mechanisms and alternative compliance mechanisms;

- Convening an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee to advise CARB; and
- Ensuring public notice and opportunity for comment for all CARB actions.

In pursuit of these goals, the CARB must balance the need to reduce GHGs with the need to prevent major disruptions to public health and the economy. The CARB must consider equity between regulated entities, electricity reliability, and must ensure that the rules do not have a disproportionate impact upon low income communities. See <http://gov.ca.gov/index.php?/press-release/4111/> for more information.

Low Carbon Fuel Standard (LCFS)

California has chosen to strike a balance between regulatory and market-based approaches to reducing carbon emissions from vehicles. The LCFS requires fuel providers to reduce the carbon intensity of transportation fuels sold in the state, which in turn expands the market for alternative fuels. The LCFS is expected to be implemented before the end of 2008 and aims to reach a 10% reduction in carbon intensity in passenger vehicles by 2020. Providers can earn credits for emissions reductions in fuel production at various points along the supply chain, from extraction to refining and market delivery. These credits can be bought or sold, thus allowing the market a role in emissions reduction.

Solar Roof Program

Much like it sounds, the solar roof program aims to promote the use of solar power generation from commercial and residential rooftops. California's Public Utilities Commission provides funding to encourage homeowners and business owners to install solar energy systems by offering them tax credits for the cost of the installation, and it provides rebates to commercial and residential owners with existing solar systems. There is also a property tax provision in place to prevent increased property value re-assessments upon installation of a solar system. Homeowners can expect to receive a 40% rebate on the initial cost of installing a solar energy system, and it is expected that, given the amount of overall energy savings, the system will pay for itself.

Hydrogen Highways

The government of California has entered into a public-private partnership to build a hydrogen highway in the state by 2010. In other words, this highway will offer hydrogen fueling stations throughout the state to ease the conversion to hydrogen-based transportation, to help lower overall carbon emissions. This will assist the state in its campaign to persuade Californians of the economic viability of hydrogen-fueled vehicles. The estimated cost of this fuel network is approximately \$90 million, which will come largely from private investment by automakers and high tech firms.

4. Regional Efforts

Western Climate Initiative (WCI)

California is a founding member of the Western Climate Initiative, along with Arizona, New Mexico, Oregon and Washington. Later joined by Montana, Utah, Manitoba and British Columbia, the WCI was created to develop regional strategies for addressing climate change. The group set an overall aggregate GHG reduction target of 15% below 2005 levels by 2020, and is in the process of designing a market-based mechanism such as

Singapore: A Green Global Leader

Singapore, a Southeast Asian city-state of approximately 4.6 million people, became a party to the Kyoto Protocol in 2006. It has set a national target for carbon emissions reductions of 25% below 1990 levels by 2012. In 2005, carbon intensity was already at 22% below 1990 levels, so Singapore is well on its way to meeting its target. The greatest percentage of carbon emissions in the country come first from its manufacturing sector and second from transportation.

According to the Singapore Green Plan 2012, in order to meet the country's 2012 emissions targets, the government will promote energy efficiency, cleaner energy (such as natural gas), facilitate demonstration projects in renewable energy (e.g., solar or biomass), and develop technological advancements in renewable energy through its Innovation for Environmental Sustainability Fund.

Singapore's National Energy Efficiency Committee coordinates energy efficiency programs nation-wide, and is focused on making Singapore a pioneer in the testing of emerging energy technologies. With respect to its own electricity generation, Singapore produces electricity primarily with natural gas, as they have moved away from oil fired power generation. These changes have enabled them to reduce emissions by 2.5 million tonnes per year.

Since vehicle emissions are the second largest source of the country's GHG emissions, Singapore introduced Euro IV standards in 2006. (European emissions standards refer to limitations on exhaust emissions from new vehicles sold in the European Union. The standards, which were initially implemented in 1993, have been designed to grow increasingly stringent, with the most current rating, Euro V, applicable to vehicles sold in 2008/2009.) The standards have also been adopted in other jurisdictions as well and a tax break has been offered in Singapore for vehicles meeting the Euro IV standard.

Also in pursuit of reduced vehicle emissions, Singapore has adopted a three part strategy that includes: managing vehicle use (by discouraging car ownership through limits to vehicle registration and reducing congestion through electronic road pricing and improved public transportation); improving fuel efficiency of vehicles (by attaching road taxes to engine capacity and collecting a gas tax on a per litre basis); and promoting the use of green vehicles through a Green Vehicle Rebate.

See www.mewr.gov.sg/sgp2012/index.html for more information.

a regional cap-and-trade system to help advance this goal, the details of which are expected in August 2008.

New England Governors/Eastern Canadian Premiers (NEG/ECP)

The New England Governors and Eastern Canadian Premiers climate action group was formed in 2001 and consists of the US states of Vermont, New Hampshire, Maine, Massachusetts, Rhode Island and Connecticut, and the Canadian provinces of Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador.

The goal was to create an environment of support to enable collaboration across state, provincial and regional climate change plans. Within this broader purpose, the NEG/ECP have a short-term goal of reducing GHG emissions to 1990 levels by 2010, a medium-term goal of reducing emissions to 10% below 1990 levels by 2020 and a long-range goal of reducing emissions to whatever level is necessary to reduce the impact upon the global climate.

The NEG/ECP have embraced a set of 9 key priorities moving forward:

- Establishing a standardized GHG emissions inventory;
- Establishing a plan for reducing GHG emissions and energy conservation;
- Promoting public awareness;
- Encouraging state and provincial governments to lead by example (stresses the importance of the public sector taking measures to reduce energy consumption and carbon emissions through the use of lower carbon fuels and the purchase of energy efficient vehicles);
- Reducing GHGs from the electricity sector (the current goal is a 20% reduction in CO₂ emitted per megawatt hour of use by 2025);
- Reducing total energy demand throughout the region;
- Reducing or mitigating the social, economic and environmental impacts of climate change;

- Decreasing GHG emissions from the transportation sector; and
- Creating a regional emissions registry and exploring an emissions trading mechanism.

5. Conclusion

Efforts to address climate change as a result of GHG emissions are taking place across North America and beyond. The GHG reduction strategies by various jurisdictions in Canada and the United States outlined above are an excellent representation of the kind of policy innovation that is possible. And there is some overlap with respect to what these governments are doing. Some have opted for economic policy instruments to provide incentives for carbon reduction, others have invested in renewable energy and still others have worked to develop alternatives to heavy vehicle use such as improvements to safe and reliable transportation.

Each jurisdiction is different though, and what works for some might not work for all. What is certain is that each of these cities, provinces, and states has taken the issue of climate change seriously and has developed a basket of policy tools to help address the challenge. This report has identified some of the more notable ways in which governments across Canada and the US are making a contribution in the hope of providing a backdrop for a future discussion about the tools available to governments in the pursuit of workable and innovative responses to this global challenge.

About the Canada West Foundation

Our Vision

A dynamic and prosperous West in a strong Canada.

Our Mission

A leading source of strategic insight, conducting and communicating non-partisan economic and public policy research of importance to the four western provinces and all Canadians.

Canada West Foundation is a registered Canadian charitable organization incorporated under federal charter (#11882 8698 RR 0001).

In 1970, the One Prairie Province Conference was held in Lethbridge, Alberta. Sponsored by the University of Lethbridge and the Lethbridge Herald, the conference received considerable attention from concerned citizens and community leaders. The consensus at the time was that research on the West (including BC and the Canadian North) should be expanded by a new organization. To fill this need, the Canada West Foundation was created under letters patent on December 31, 1970. Since that time, the Canada West Foundation has established itself as one of Canada's premier research institutes. Non-partisan, accessible research and active citizen engagement are hallmarks of the Foundation's past, present and future endeavours. These efforts are rooted in the belief that a strong West makes for a strong Canada.

More information can be found at www.cwf.ca.

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